

**In The Claims:**

1 (Currently Amended)      A method for creating a narrow linewidth hybrid semiconductor laser comprising:  
coupling using a ring resonator in combination with external feedback elements that use Bragg gratings semiconductor gain chip to a single external feedback element, said external feedback element comprising a ring resonator and a Bragg grating.

5. (Currently Amended)      The method of claim 1 wherein said external feedback elements comprise of element is coupled to a waveguide.

6. (Original)      The method of claim 5 wherein said waveguide is made of silicon-oxide and silicon-oxinitride.

7. (Original)      The method of claim 1 wherein said ring resonator is based on plasma enhanced chemical vapor deposition silicon-oxide/silicon-oxinitride waveguide technology.

8. (Original)      The method of claim 1 wherein said ring resonator further comprises a waveguide ring and two straight waveguide sections.

9. (Original)      The method of claim 8 wherein said waveguide ring and said two straight waveguide sections are coupled through evanescent wave interaction.

10. (Cancelled).

11. (Cancelled).

12. (Currently Amended) ~~An apparatus for creating a~~ A narrow linewidth hybrid semiconductor laser apparatus comprising:

~~the use of a ring resonator in combination with~~ semiconductor gain chip coupled to a single external feedback element ~~elements that use Bragg gratings, said external feedback element comprising a ring resonator and a Bragg grating.~~

16. (Currently Amended) The apparatus of claim 12 wherein said external feedback ~~elements comprise of~~ element is coupled to a waveguide.

17. (Original) The apparatus of claim 16 wherein said waveguide is made of silicon-oxide and silicon-oxinitride.

18. (Original) The apparatus of claim 12 wherein said ring resonator is based on plasma enhanced chemical vapor deposition silicon-oxide/silicon-oxinitride waveguide.

19. (Original) The apparatus of claim 12 wherein said ring resonator further comprises a waveguide ring and two straight waveguide sections.

20. (Original) The apparatus of claim 19 wherein said waveguide ring and said two straight waveguide sections are coupled through evanescent wave interaction.

21.(Cancelled).

22.(Cancelled).

**RESPONSE**

Claims 1, 5-12, and 16-22 are pending in the application. Claims 1, 5-12, and 16-22 have been rejected. Applicant has amended claims 1, 5, 12, and 16, and cancelled claims 10, 11, 21, and 22. Reconsideration and re-examination of pending claims 1, 5-9, 12, 16-20 is respectfully requested.

**Claim Rejections based on 35 USC 112**

Claims 1, 5-12, and 16-22 are rejected under 35 USC 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Independent claims 1 and 12 recite a "ring resonator" in combination with external "feedback elements." The claims are drawn into a "single means claim" or a "single step" method claim. Therefore, the claims fail to comply with MPEP 2164.08(a) single means claim. Furthermore, the individual components comprising the "ring resonator" and the "feedback elements" are not stated. The claims fail to provide any elements or structural relationships to conform the ring resonator. Therefore, the claims are rendered vague and indefinite. Claims 1 and 12 also recite "using" and "the use of", respectively. Such words and phrases are vague and cannot be used in claim language.

Applicant states that the independent claims 1 and 12, as amended, complies with MPEP 2164.08(a) and hence the 112 rejection for these claims is moot. The remaining claims (viz. 5-9, and 16-20) are dependent on one of independent claims 1 and 12 and hence the 112 rejection for these claims is moot as well.

**Claim Rejections based on 35 USC 102**

The Examiner has rejected claims 1, 5, 8-10, 12, 16, and 19-21 under 35 U.S.C. 102(b) as being anticipated by Bernard et. al. '342. Applicant respectfully disagrees that independent claims 1 and 12, as amended, anticipate Bernard et. al. (Bernard) and states:

Firstly, the ring/grating combination of Bernard is not a single element (see Figs. 6-8 in Bernard) with the grating and the ring resonator on opposite sides of the laser. The present invention, on the other hand, has the ring/grating combination within a single element on the same side of the laser (see Fig. 7 in the present invention). Secondly, the grating in Bernard is a regular ruled grating unlike the Bragg grating of the present invention. Both these differences make it possible, in the present invention, to make a single external feedback element that can be tested separately from the gain chip. Since claims 5, 8, 9, 16, 19, and 20 depend on a now allowable base claim and claims 10 and 21 are cancelled, their rejection is moot.

The Examiner has rejected claims 1, 5, 8-12, 16, and 19-22 under 35 U.S.C. 102(a) as being anticipated by Deacon '517. Applicant respectfully disagrees that independent claims 1 and 12, as amended, anticipate Deacon and states:

Deacon's proposed device is not a single feedback element, nor can it be used as one because it has peaks in transmittance. Because a semiconductor gain chip coupled to a single feedback element comprising of a ring resonator and Bragg grating combination is needed for creating a narrow linewidth laser, Deacon's device is not suitable for the intended purpose of the present invention which is to create a narrow linewidth hybrid laser. Since claims 5, 8, 9, 16, 19, and 20 depend on a now allowable base claim and claims 10, 11, 21, and 22 are cancelled, their rejection is moot.

The Examiner has rejected claims 1, 5, 8, 9, 12, 16, 19, and 20 under 35 U.S.C. 102(a) as being anticipated by Stepanov et. al. '165. Applicant respectfully disagrees that independent claims 1 and 12, as amended, anticipate Stepanov et. al. (Stepanov) and states:

The ring and the Bragg grating of Stepanov are an integral part of the fiber laser rather than part of the single external feedback element as in the present invention. Since

a gain chip coupled to an external single feedback element comprising of a ring resonator and a Bragg grating is needed in creating a narrow linewidth hybrid laser, as in the present invention, Stepanov's device is not suitable for the intended purpose of the present invention. Since claims 5, 8, 9, 16, 19, and 20 depend on a now allowable base claim, their rejection is moot.

The Examiner has rejected claims 1, 5, 8, 9, 16, 19, and 20 under 35 U.S.C. 102(e) as being anticipated by Jordan et. al. '795. Applicant respectfully disagrees that independent claim 1, as amended, anticipates Jordan et. al. (Jordan) and states:

The Jordan patent is not a narrow linewidth laser apparatus or a method to create a narrow linewidth laser, but a device with a variety of add/drop filters. Since a gain chip coupled to a single external feedback element comprising of a ring resonator and a Bragg grating, as in the present invention, is needed in creating a narrow linewidth hybrid laser, Jordan's device is not suitable for the intended purpose of the present invention. Since claims 5, 8, 9, 16, 19, and 20 depend on a now allowable base claim, their rejection is moot.

#### Claim Rejections based on 35 USC 103

Examiner has rejected claims 6, 7, 17, and 18 under 35 U.S.C. 103 (a) as being unpatentable over Bernard in view of Valette '513 or Holzner et. al. '885. Applicant states that since claims 6, 7, 17, and 18 are dependent on a now allowable base claim 1 or 12, their rejection is moot.

Examiner has rejected claims 6, 7, 17, and 18 under 35 U.S.C. 103(a) as being unpatentable over Deacon in view of Valette '513 or Holzner et. al. '885. Applicant states

that since claims 6, 7, 17, and 18 are dependent on a now allowable base claim 6, their rejection is moot.

CONCLUSION

For at least the foregoing reasons, Applicant respectfully submits that pending claims 1, 5-9, 12, and 16-20 are patentably distinct from the prior art of record and in condition for allowance. Applicant therefore respectfully requests that pending claims 1, 5-9, 12, and 16-20 be allowed.

Respectfully submitted,

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By: 

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